

Domestic Nuclear Detection Office (DNDO)

Interoperability Standards and Capabilities for the Global Nuclear Detection Architecture

Dec 5, 2011

Dr. W. R. Wright
Architecture Support to CIO
Domestic Nuclear Detection Office (DNDO)



Homeland
Security

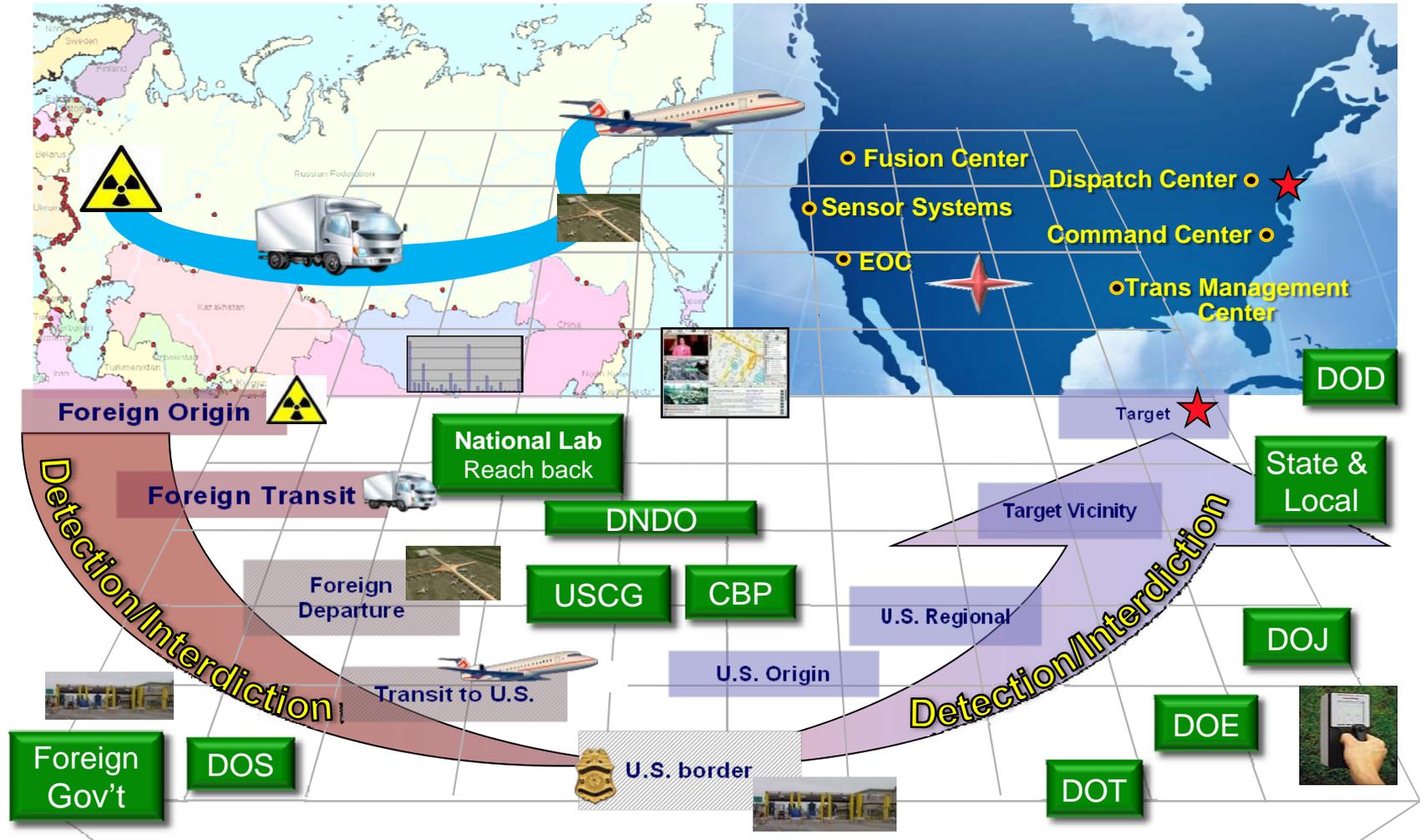
Agenda

- **GNDA – Setting the context**
- **ISP – Interoperability standards for the GNDA**
 - **NIEM CBRN Domain**
 - **N.25 Message Protocol**
 - **IEC/ANSI N42 Standards**
 - **Related Data Standards**
- **MCM – Mediating among standards**
- **Planning look ahead: 2012-2013**



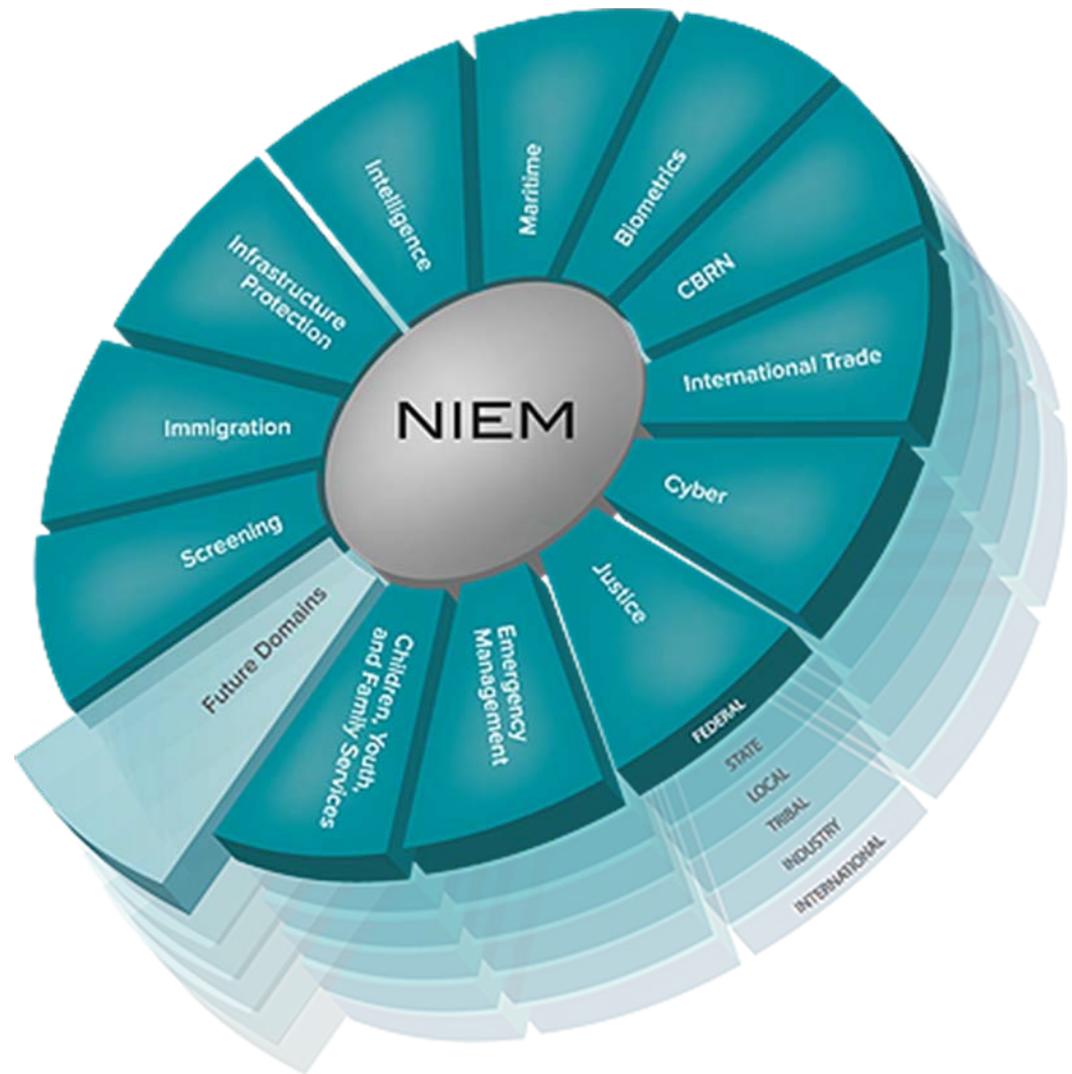
The GNDA has many organizational players...

Information sharing across the GNDA is needed to stop terrorists



NIEM CBRN Domain

- NIEM CBRN Domain developed/stewarded by DNDO for Rad/Nuc detection/interdiction mission
- NIEM-conformant XML schema supporting mission specific information exchange messages



Major Data Classes of the CBRN Domain

- Detection Event
- Detection Device
- Radiation Measurement
- Alarm
- Measured Item
- Conveyance
- Event Analysis
- Data File
- Case
- Message



N.25 Message Protocol

- N.25 provides NIEM standard XML messages for RadNuc detection/interdiction activities
 - 51 messages in 9 message types
 - Focused on “cargo” & “conveyances”
 - NIEM-conformant
 - Uses the CBRN Domain for interoperable data definitions
- Early version used on the Southeast Transportation Corridor Program (SETCP)
- Included in the DNDO Messaging program
- Expected use by State & Local
 - DNDO Secure the Cities Program
 - DHS/S&T ICBRNE Program

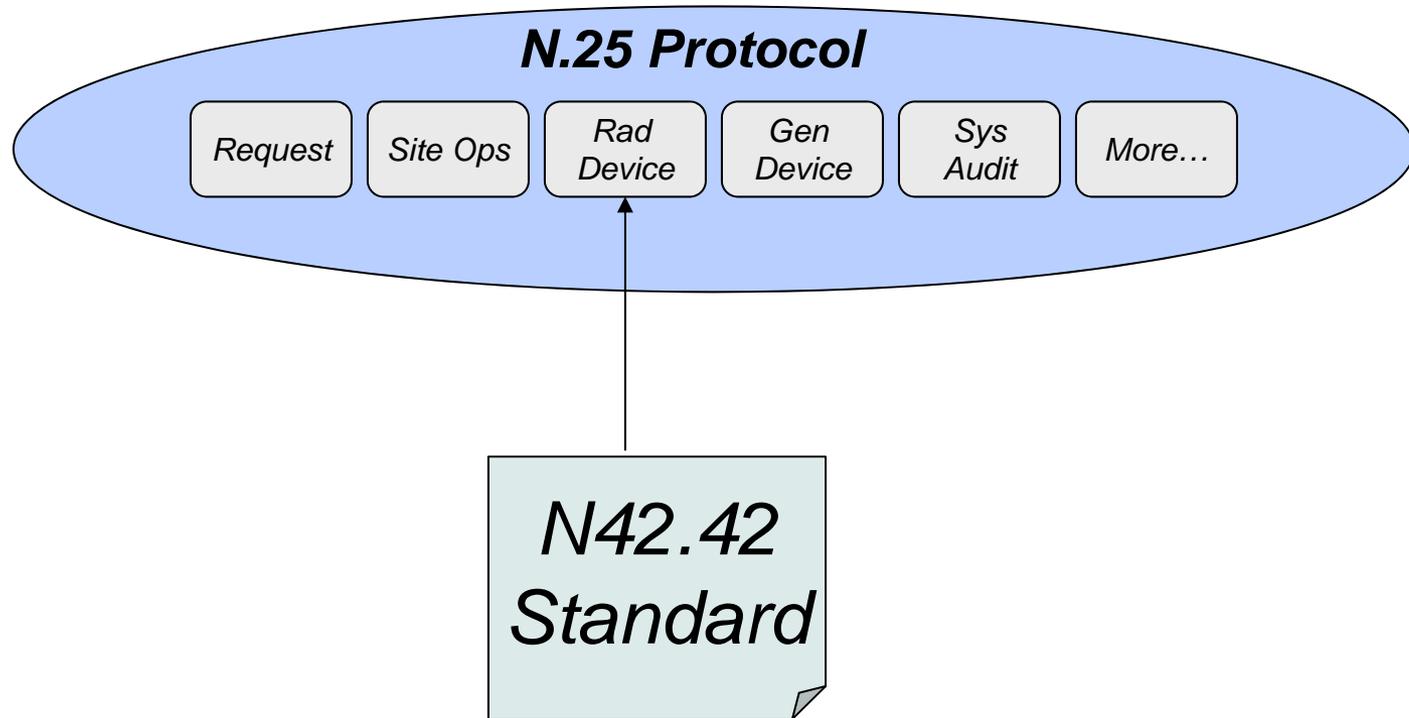


N.25 Message Types

- Alarm Summary Message
- Radiation Device Message
- General Device Message
- Device Configuration And Health Status Message
- Site Operations Info Message
- Conveyance Tracking Message
- Request Message
- System Audit Message
- Situational Awareness



N42.42 and N.25

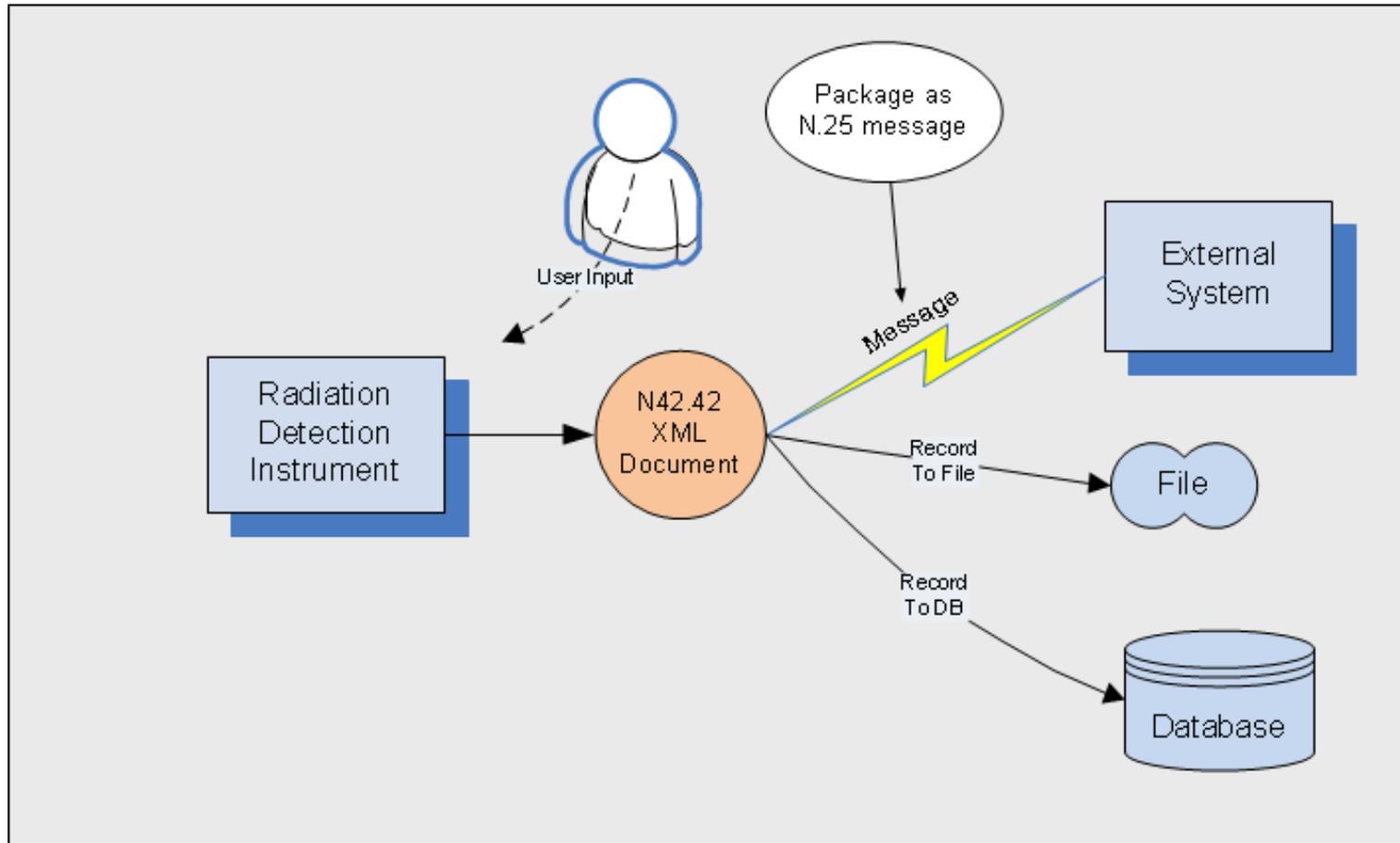


IEC/ANSI N42 Standards

- Technical standards for radiation detection
 - Ex: N42.38 -Performance Criteria for Spectroscopy-Based Portal Monitors Used for Homeland Security
- N42.42 – Radiation Data Format Standard
 - Originally published 2006 (started 2004)
 - Defines XML formatted output of radiation detection instruments
 - Developed pre-NIEM
 - DNDO worked with the ANSI committee 2009-2011 to update
 - “NIEM-ify”
 - Technical improvements to the standard
 - Currently in International Review for release as an IEC standard
 - Publication expected 2012



Relationship to N.25



N42 output from a Radiation Detection Instrument wrapped as N.25 message.

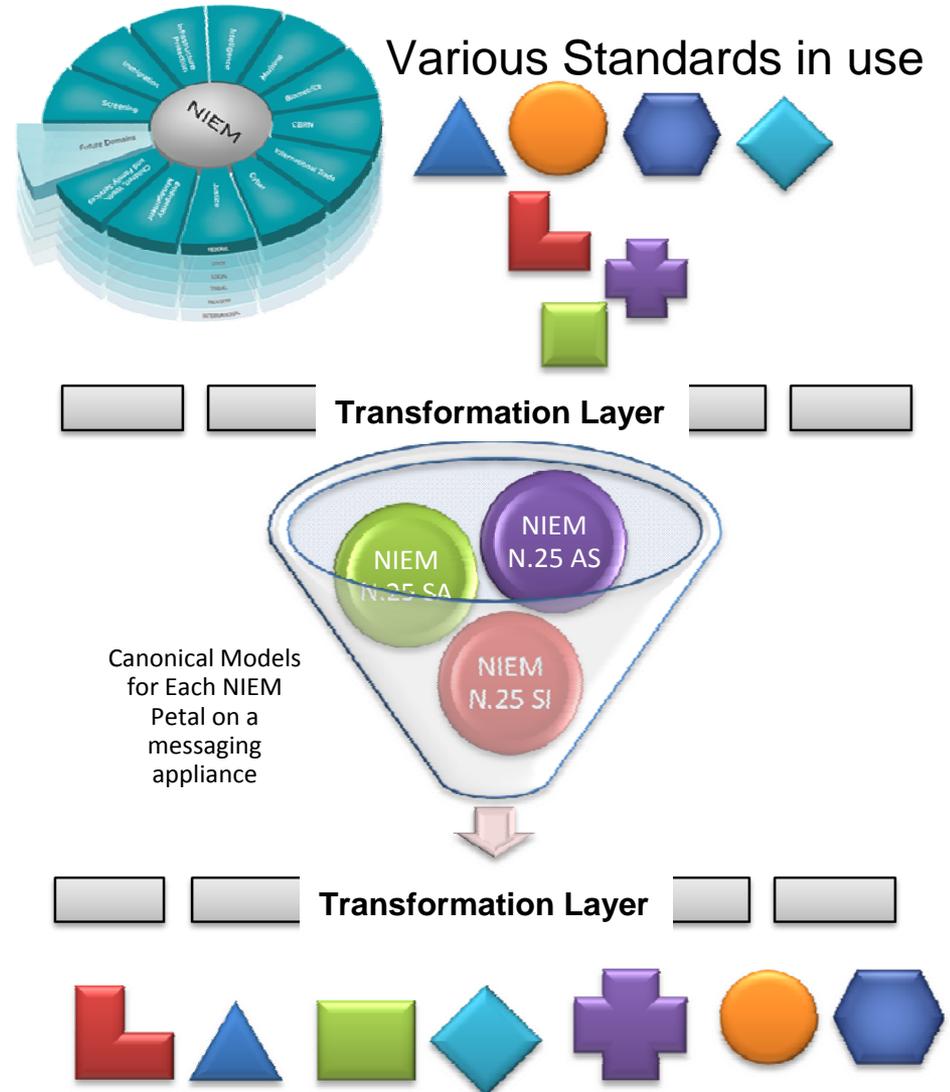
Related Data Standards

- Issue:
 - Other standards in use across the GNDA
 - Evolution to common standards will take a long time
 - Need to support other standards in significant use
- Example Standards
 - EDXL (N.25 adopted EDXL-DE for external wrapper)
 - CAP (Common Alerting Protocol)
 - LEXS (Law Enforcement – NIEM conformant)
 - ATP-45 (NATO/DOD)
 - TMDD (Transportation Management)
- Strategy: mediate via Messaging Appliance
 - Format translation
 - Wrapping



The DNDO Messaging Appliance Can Broker Disparate Enterprise Information

- Various Standards are in use across the GNDA organizations:
 - NIEM N.25, IEEE, LEX, SAR, CoT, CAP, EDXL, UCore, Etc.
- The MCM Solution implements Canonical NIEM N.25 data models as the central transport format
 - Unique Publisher and Subscriber formats are transformed to known standards prior to transmitting data
 - Known standards are mapped to and transformed to the appropriate NIEM Canonical Models
- This approach has been demonstrated successfully by DNDO and can be extended to additional NIEM Domains to enable cross-domain messaging



Homeland
Security

Planning Look Ahead: 2012-2013

- Establish Interoperability Policy and Specifications for the GNDA mission community
- Establish GNDA COI and standards/specifications governance process
- Produce new version of CBRN Domain aligned with the new IEC/ANSI N42.42
- Harmonize CBRN Domain with adjacent NIEM Domains
- Update RDF Specification for the new CBRN Domain version
- Produce new N.25 IEPD messages for emerging requirements
- Develop rules-based validator for N42.42-formatted detector output XML



Homeland Security